TRENCHING AND EXCAVATION WORKSHEET

VIRGINIA DEPARTMENT OF LABOR AND INDUSTRY

Date: _____ **Time:**

_____/_____/_____
CSHO ID **Opt. Rpt. No.** **Yr.**

1. Employer:

2. Site Address:

3. Witness/
Exposed Employee(s): **Number Exposed:**

4. Photos Taken? _____ **Yes** _____ **No** ***If No, Why Not?***

5. Water in Trench Excavation? **Yes** **No** ***If Yes, Circle Source*** **Running** **Rainwater** **Underground** **Other**

6. Type of Material: **Unstable/soft** **Hard/compact** **Other**

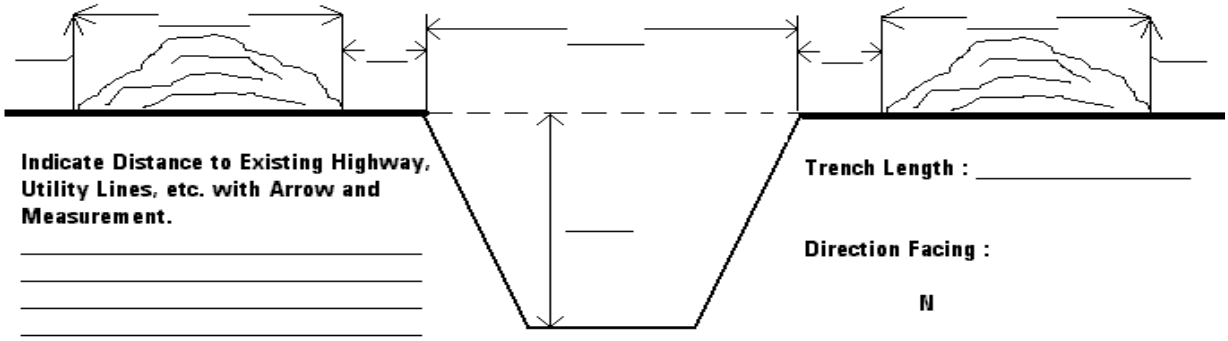
7. Superimposed Load or Equipment Adjacent _____ **Yes** _____ **No** **Type:**

8. Previously Excavated/ Subject to Vibrations _____ **Yes** _____ **No** **Detail:**

9. Ladder _____ **Yes** _____ **No** **Tied?** **Above Landing?**
PPE _____ **Yes** _____ **No** **(Hard Hat)**

10. Confined Space? _____ **Yes** _____ **No** **If Yes, Reason:**

Indicate Dimensions



Indicate Distance to Existing Highway, Utility Lines, etc. with Arrow and Measurement.

_____
_____
_____
_____
_____
_____
_____

Trench Length : _____

Direction Facing :

N

W E

S

Additional Comments on Reverse

Additional Comments

COMPETENT PERSON INTERVIEW STATEMENT

Date: _____ Time: _____ CSHO Id. _____
Insp. No. _____

Employee Name:_____ Phone: _____

Address:_____

Occupation:_____

Employer Name: _____ Employed from:_____ To:_____

___ Credentials presented ____ Discrimination explained

Union:_____Yes ***If yes,*** **Bargaining Unit:**
_____No Address & Phone:

HAZCOM:

_____Yes_____No Access to written program?
_____Yes_____No Access to MSDS?
_____Yes_____No Hazards of chemicals & precautions explained?
_____Yes_____No Labeling system explained?
_____Yes_____No Training?

RAMPS:

_____Yes_____No Is Employer using a structural ramp?
[*If no, skip to next section*]

_____Yes_____No Is ramp used solely for employee access? If yes,

_____Yes_____No was it designed by competent person for safe access & egress?

_____Yes_____No Is ramp used for access and egress of equipment?

_____Yes_____No Is the competent person who designed the ramp qualified in structural design? List qualifications:_____

_____Yes_____No Does ramp meet design specifications?

CONFINED SPACE:

_____Yes_____No Does trench or excavation meet definition of Confined Space? [*If no, skip to next paragraph.*]

_____Yes_____No Is the competent person ('qualified person') trained to recognize and evaluate confined space hazards?
Detail:_____
_____

_____Yes_____No Is the competent person capable of specifying necessary control measures to assure worker safety?
Detail:_____
_____

WATER CONDITIONS:

_____Yes_____No Is dewatering equipment being used on the site? If yes,

_____Yes_____No Is the competent person monitoring the equipment and its proper operation?

_____Yes_____No Has the excavation been subjected to heavy rainfall? If yes,

_____Yes_____No Has the competent person inspected the excavation and complied with precautions of (h) (1) and (h) (2)?

INSPECTIONS:

_____Yes_____No Has the competent person conducted daily inspections of the excavation?

_____Yes_____No Has the competent person conducted daily inspections of the adjacent areas?

_____Yes_____No Has the competent person conducted daily inspections of protective systems?

_____Yes_____No Were these inspections conducted prior to the start of work?

_____Yes_____No Were these inspections conducted as needed throughout the work shift?

____Yes_____No **Were these inspections conducted after rainstorm or hazard-increasing occurrence?**

____Yes_____No **Based on CSHO's observation, has the competent person failed to recognize situations that could result in cave-ins?**

If yes, detail:_____

_____

____Yes_____No **Does the competent person have the authority to remove employees from a hazardous area until proper precautions are taken?**

PROTECTIVE SYSTEMS:

General:

____Yes_____No **Is the excavation less than five (5) feet deep? If yes,**

____Yes_____No **Has the competent person examined the ground for indication of potential cave-in?**

____Yes_____No **Has the competent person inspected any damaged material or equipment used for protective systems and evaluated its suitability for continued use?**

USE OF APPENDICES:

____Yes_____No **Is the employer relying upon either Appendices:**

A & B to design a sloping and shoring system (_____ Option 2)
OR
A & D to select and construct a protective system (_____ Option 1)
If yes for either option,

____Yes_____No **Has the competent person properly classified the soil using Appendix A?**

What type of soil does the competent person say is in the excavation? _____

_____

What visual test(s) did the competent person perform?_____

_____

What manual test(s) did the competent person perform?_____

Have conditions changed since the classification was made?_____

Did the competent person choose the proper sloping or benching configuration from Appendix B (or the proper shoring from Appendix D)?_____

If no, detail:

ADDITIONAL STATEMENTS

_____ _____

Signature of CSHO **Signature of Competent Person**

CONCLUSION

____Yes_____No **Has the Competent Person performed all tasks required by the standard?**

____Yes_____No **Is the person "capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous or dangerous to employees"?**

If not, list deficiencies: _____

_____

_____

____Yes_____No **Is the person authorized to take prompt corrective measures to eliminate such hazards or conditions?**

SOIL ANALYSIS CHECKLIST A

The following checklist can be used in the field to determine the soil type(s) present in an excavation. A separate analysis should be done on each layer of soil in the excavation wall.

DATE:_____ **CSHO ID NO.:**_____

EMPLOYER:_____

SITE LOCATION:_____

WHERE SAMPLE WAS TAKEN FROM:_____

APPROXIMATE DEPTH:_____

VISUAL TESTS

1. Particle size:

_____ **Fine-grained? (Cohesive)**

_____ **Coarse-grained, e.g., sand or gravel? (Granular)**

2. Excavated soil:

_____ **Remains in clumps (Cohesive)**

_____ **Breaks up easily and does not stay in clumps? (Granular)**

3. Sides of excavation and adjacent surface area:

_____ **Crack-like openings? (Indicates fissured material)**

_____ **Chunks of soil spalling from sides? (Moving ground; fissured material)**

4. Previously disturbed soil:

_____ **Evidence of existing utility or other underground structures?**

_____ **Other evidence that soil previously disturbed?**

5. Layered system:

If opened side of excavation shows layered system, examine to determine if layers slope toward excavation. Estimate degree of slope of layers: _____

6. Water conditions:

_____ **Evidence of surface water?**

_____ **Water seeping from sides of excavation?**

_____ **Location of level of water table?**

7. Vibration:

_____ **Sources of vibration in excavation or in area adjacent to excavation?**

Identify:_____

MANUAL TESTS

1. Plasticity:

Mold moist or wet sample of soil into a ball and roll into 1/8 inch threads. If material can be rolled into threads at least 2 inches long without crumbling or tearing, soil is cohesive.

RESULT:

2. Dry strength:

Does dry soil crumble on its own, or with moderate pressure, into individual grains or fine powder?

_____

If so, soil is granular.

Does dry soil fall into clumps which break up into smaller clumps and are the smaller clumps only broken up with difficulty?_____
If so, soil may be clay in any combination with gravel, sand or silt.

Does dry soil break into clumps which do not break up into smaller clumps? Can these clumps only be broken with difficulty? Is there no visual indication the soil is fissured?_____

_____**If so, the soil may be considered unfissured.**

3. Thumb penetration:

(Conduct test on undisturbed clump of soil that has not had opportunity to dry.)

Can the soil be readily indented with the thumb, but be penetrated only with great effort?_____

If so, the soil is Type A. (Unconfined compressive strength of 1.5 tsf)

Can soil be easily penetrated several inches by thumb and molded by light finger pressure?_____

If so, soil is Type C. (Unconfined compressive strength of 0.5 tsf)

Other manual tests, including pocket penetrometer, hand-operated shearvane, or drying test, need not be conducted by the CSHO. If the employer has used these tests to determine soil type, verify by use of the above manual tests. Use this section to record the employer's results:

ANALYSIS:

_____ **Stable rock**

_____ **Type A**

_____ **Type B**

_____ **Type C**

SOIL ANALYSIS CHECKLIST B

The following checklist can be used in the field to determine the soil type(s) present in an excavation. A separate analysis should be done on each layer of soil in the excavation wall.

DATE:_____ **CSHO ID NO.:**_____

EMPLOYER:_____

SITE LOCATION:_____

WHERE SAMPLE WAS TAKEN FROM:_____

APPROXIMATE DEPTH:_____

VISUAL TESTS

This analysis should be used to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material.

1. **Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.**

   RESULTS:

2. **Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.**

   RESULTS:

3. **Observe the sides of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of moving ground and are indications of potentially hazardous situations.**

   RESULTS:

4. **Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures and identify previously disturbed soil.**

   RESULTS:

5. **Observe the opened side of the excavation to identify layered systems. Examine layered systems to identify whether the layers slope toward the excavation. Estimate the degree of slope of the layers.**

   RESULTS:

6. **Observe the area adjacent to the excavation and the sides of the opened excavation for the evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.**

RESULTS:

7. **Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.**

RESULTS:

MANUAL TESTS

These tests are conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly.

1. **Plasticity. Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8-inch in diameter. Cohesive material can successfully be rolled into threads without crumbling. For example, if at least a two inch (50 mm) length of 1/8-inch thread can be held on one end without tearing, then the soil is cohesive.**

RESULTS:

2. **Dry strength. If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (any combination of gravel, sand or silt). If the soil is dry and falls into clumps which break up into smaller clumps but the smaller clumps can only be broken up with difficulty, it may be clay in combination with gravel, sand or silt. If the dry soil breaks into clumps which do not break up into smaller clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unfissured.**

RESULTS:

3. **Thumb penetration. The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure. This test should be conducted on an undisturbed soil sample, such as a large clump of soil as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences. If the excavation is later exposed to wetting influences (rain, flooding) the classification of the soil must be changed accordingly.**

RESULTS:

The following manual tests need not be conducted by the CSHO. IF the employer has used these tests to determine soil type, verify by use of the above manual tests. Use this section to record the employer's results.

4. Other strength tests. Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or by using a hand-operated shearvane.

RESULTS:

5. Drying test. The basic purpose of the drying test is to differentiate between cohesive material with fissures, cohesive material without fissures, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (2.45 cm) and six inches (15.24 cm) in diameter until it is thoroughly dry.

   A. If the sample develops cracks as it dries, significant fissures are indicated.

   B. Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as an unfissured cohesive material and the unconfined compressive strength should be determined.

   C. If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

EMPLOYER'S RESULTS:

ANALYSIS

This section reviews the four classifications of soil in Appendix A. Note in the left margin the classification of this sample:

_____ Stable rock means natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

_____ Type A means cohesive soils with an unconfined compressive strength of 1.5 ton per square foot (tsf) (144kPa) or greater. Examples of cohesive soils are: clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils, such as caliche and hardpan, are also considered Type A.

However, soil is NOT Type A if:

i. The soil is fissured, or

ii The soil is subject to vibration from heavy traffic, pile driving or similar effects, or

iii. The soil has been previously disturbed, or

iv. The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H: 1V) or greater, or

v. The material is subject to other factors that would require it to be classified as a less stable material.

_____ Type B means:

i. **Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (144 kPa) but less than 1.5 tsf (144 kPa); or**

ii. **Granular cohesionless soils, including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam, and, in some cases, silty clay loam and sandy clay loam.**

iii. **Previously disturbed soils except those which would otherwise be classed as Type C soil.**

iv. **Soil that meets the unconfined compressive strength or cementation requirements for Type A but is fissured or subject to vibration, or**

v. **Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H: 1V), but only if the material would otherwise be classified as Type B.**

_____ Type C means:

i. **Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less, or**

ii. **Granular soils including gravel, sand and loamy sand, or**

iii. **Submerged soil or soil from which water is freely seeping, or**

iv. **Submerged rock that is not stable, or**

v. **Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H: 1V) or steeper.**